

Northern goshawk responses to taped conspecific calls were significantly ($P = 0.02$) higher than their responses to an observer without a tape. Detection rates were highest on transects with broadcasts during the nestling (73.1%) and fledgling-dependency periods (75.0%). During all sampling periods, the probability of detecting a northern goshawk was highest for observers broadcasting a conspecific vocalization within 150–200 m of the nest. During the nestling period, the alarm call elicited the highest detection rate while the wail and begging calls resulted in the highest detection rate during the fledgling-dependency period. Vocal mimics by jays (potential false positives) occurred on 16.7% of the transects. The lowest mimicry rates occurred during the nestling period. We recommend that northern goshawks be surveyed with broadcast conspecific vocalizations during brood rearing at stations that are 300 m apart on transects that are separated by 260 m, and that stations on adjacent transects be offset by 130 m.

LANDSCAPE ANALYSIS OF NORTHERN GOSHAWK HABITAT IN TWO FOREST REGIONS OF PENNSYLVANIA

KIMMEL, J.T. *Department of Biological Sciences, Eastern Kentucky University, Richmond, KY 40475.* R.H. YAHNER. *School of Forest Resources, The Pennsylvania State University, University Park, PA 16802*

We studied nesting habitat of Northern Goshawks (*Accipiter gentilis*) in Pennsylvania at the landscape level from 1988–92. Our objectives were to 1) contrast habitat “use” (i.e., habitat surrounding goshawk nests) with habitat “availability” (habitat associated with random points), 2) identify differences in habitat use between the Northern Hardwoods (NH) and the Appalachian Oak (AO) forest regions of the state, and 3) evaluate the relative importance of landscape features at varying levels of spatial scale. These levels were represented by six sizes of circular plots centered on nests and random points ranging from 10 ha (i.e., the “nest site” area) to 1960 ha (approximate “home range” area). Color infrared aerial photographs (1:58 000) and 7.5-min topographic maps were used to quantify landscape habitat variables. Univariate analyses indicated that goshawks selected nest sites ($P < 0.05$) on more gentle slopes and further from non-forest edges and medium-heavy duty roads on both forest regions ($N = 46$ and 29 nests and 37 and 38 random points in the NH and AO regions, respectively). At the “home range” level, nests were associated with more extensive forests, greater amounts of evergreen/mixed stands, and less residential land use areas. A slight preference for northerly aspects was observed for nests occurring on steeper slopes in the more southerly AO region. Differences in habitat use between forest regions (independent of habitat availability) indicated that goshawks in the NH region nested at higher topographic positions and in areas containing less conifers proximal to the nest tree. Comparison of results from logistic regression analysis of the different-sized plots sug-

gested that nest site habitat may be more of a limiting factor in the AO region, but that potentially higher quality foraging habitat (represented by extensive forests with mixed/evergreen stands) may be important for goshawks throughout the state. Management recommendations regarding extent of forests and evergreen/mixed stands were derived from logistic regression models and will be presented.

DIFFERENTIAL SPACE USE BY MALE AND FEMALE PRAIRIE FALCONS (*FALCO MEXICANUS*): CONSEQUENCES FOR SAMPLING REQUIREMENTS TO ESTIMATE HOME RANGES

KIMSEY, B.A. AND J.M. MARZLUFF. *Greenfalk Consultants, 8210 Gantz Avenue, Boise, ID 83709*

Determining the minimum sample of location estimates (fixes) adequate to describe an animal's home range is important in developing sampling protocols. In the Snake River Birds of Prey Area, male and female adult prairie falcons have different spatial use patterns and we report that this influences the minimum number of fixes necessary to describe male and female ranges. We sampled 60 radio-tagged adult falcons throughout the 1991 and 1992 breeding seasons and determined that females remained close to the aerie until late brood-rearing and then traveled throughout a wider foraging range, whereas males traveled throughout their entire foraging range during all phases of the breeding cycle. Maximum home range size of females was, therefore, primarily determined by fixes taken during late brood rearing and post-fledgling stages, whereas male maximum home range size was determined earlier in the breeding cycle. Because of this, it is necessary to obtain most of the fixes from late in the breeding cycle in order to adequately sample a female's home range. Males can be sampled throughout the breeding cycle. The total number of fixes should not be the only criterion used to select adequately sampled home ranges; temporal distribution of fixes is also important. In particular, some females with large numbers of fixes originating early in the breeding cycle had poorly sampled home ranges, while others with fewer total fixes but with a majority late in the breeding cycle had adequately sampled home ranges. Many raptors may show similar differences in male and female spatial use patterns and these differences should be taken into account in deciding how to sample an individual's home range.

USE OF SATELLITE TELEMETRY FOR STUDY OF A GYRFALCON IN GREENLAND

KLUGMAN, S.S. AND M.R. FULLER. *U.S. Fish and Wildlife Service, Patuxent Wildlife Research Center, Laurel, MD 20708.* P.W. HOWEY. *Microwave Telemetry, Inc., Suite 120, 8945 Guilford Road, Columbia, MD 21046.* M.A. YATES. *P.O. Box 3480, Carson City, NV 89702.* J.J. OAR. *Box 3165, Howe, ID 83244.* J.M. SEEGAR. *310 Chestnut Avenue, Towson, MD 21204.* W.S. SEEGAR.